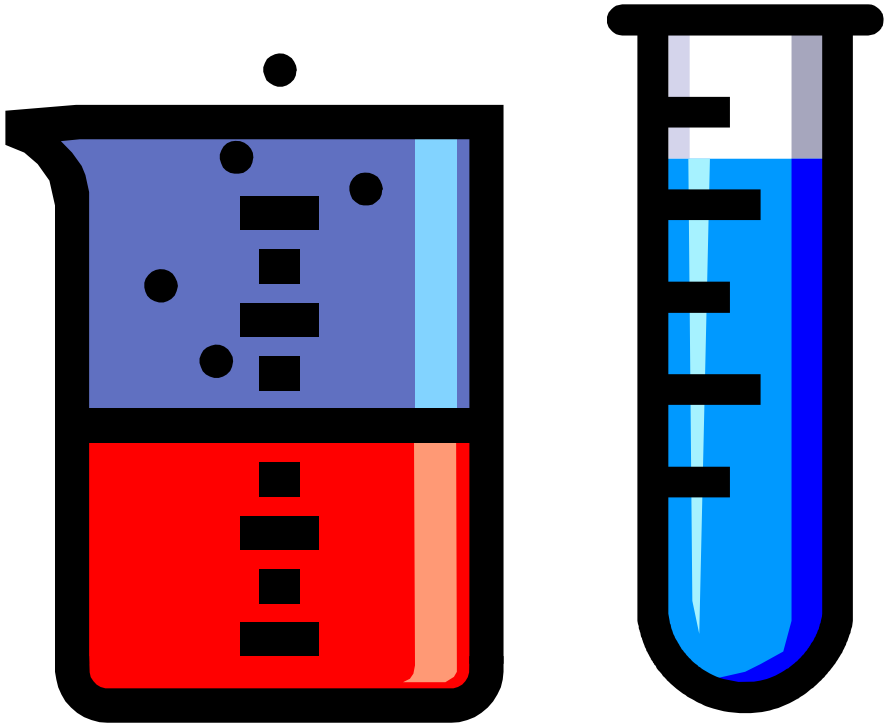
Introduction to Biological warfare

Lesson topic 4.3

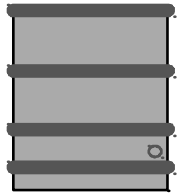


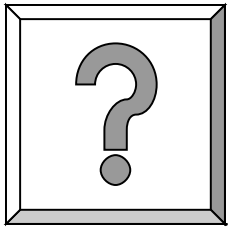
Enabling Objectives

1. Describe the methods to disseminate, detect and provide defense against biological agents
- Describe the general characteristics of biological warfare agents
- Select definitions of pathogens and a toxin
- Describe countermeasures necessary before, during and after a biological attack to minimize its effect

Biological Agents

- Divided into 2 broad categories
  - Pathogens
    - Living disease producing organisms
    - Bacteria (typhoid fever, meningitis & tuberculosis)
    - Viruses (mumps, smallpox & influenza)
    - Rickettsiae (rocky mountain spotted fever & typhus)
    - Fungi (ringworm & athlete's foot)





Biological Agents

- Toxins
  - Poisonous, unstable compounds produced by microorganisms, plants & animals
  - Not living
  - Available in the environment in small amounts
  - Actions of toxins may closely resemble those of CW

Toxins

- Cause casualties in two ways
  - Cytotoxins
    - Cause cellular destruction & are called "cell death toxins”
  - Neurotoxins
    - Interfere with nerve impulse transmission & are called "nerve toxins”
    - Affect the nervous system

Characteristic of pathogens

- Low agent required
- Delayed effect
- Effects may be lethal or non-lethal
- Pervasiveness Ability to penetrate objects
- Enter body through inhalation, ingestion or wounds
- Difficult to detect

Characteristic of pathogens

- Cannot smell, see, taste, touch or hear
- No instrument available to detect
- Easy to produce & deliver
- Nondestructive, only affect living things

Persistence of pathogens

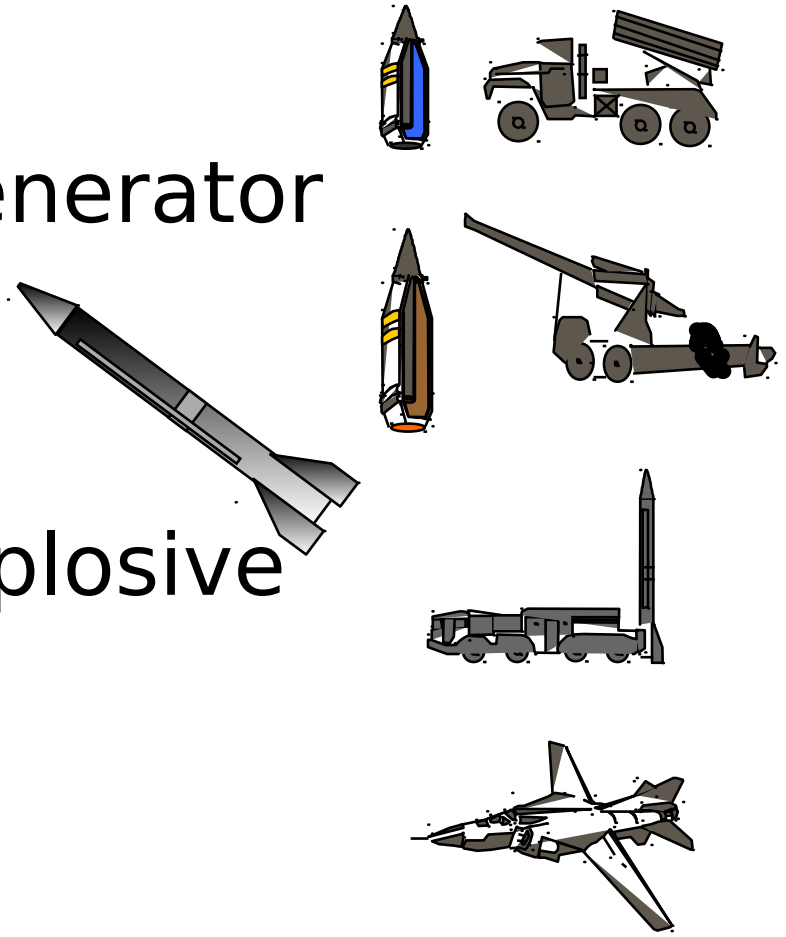
- Environmental conditions influence greatly
- Need nutrients to remain alive
- Some agents produce spores which are very resistant to weather conditions

Characteristics of toxins

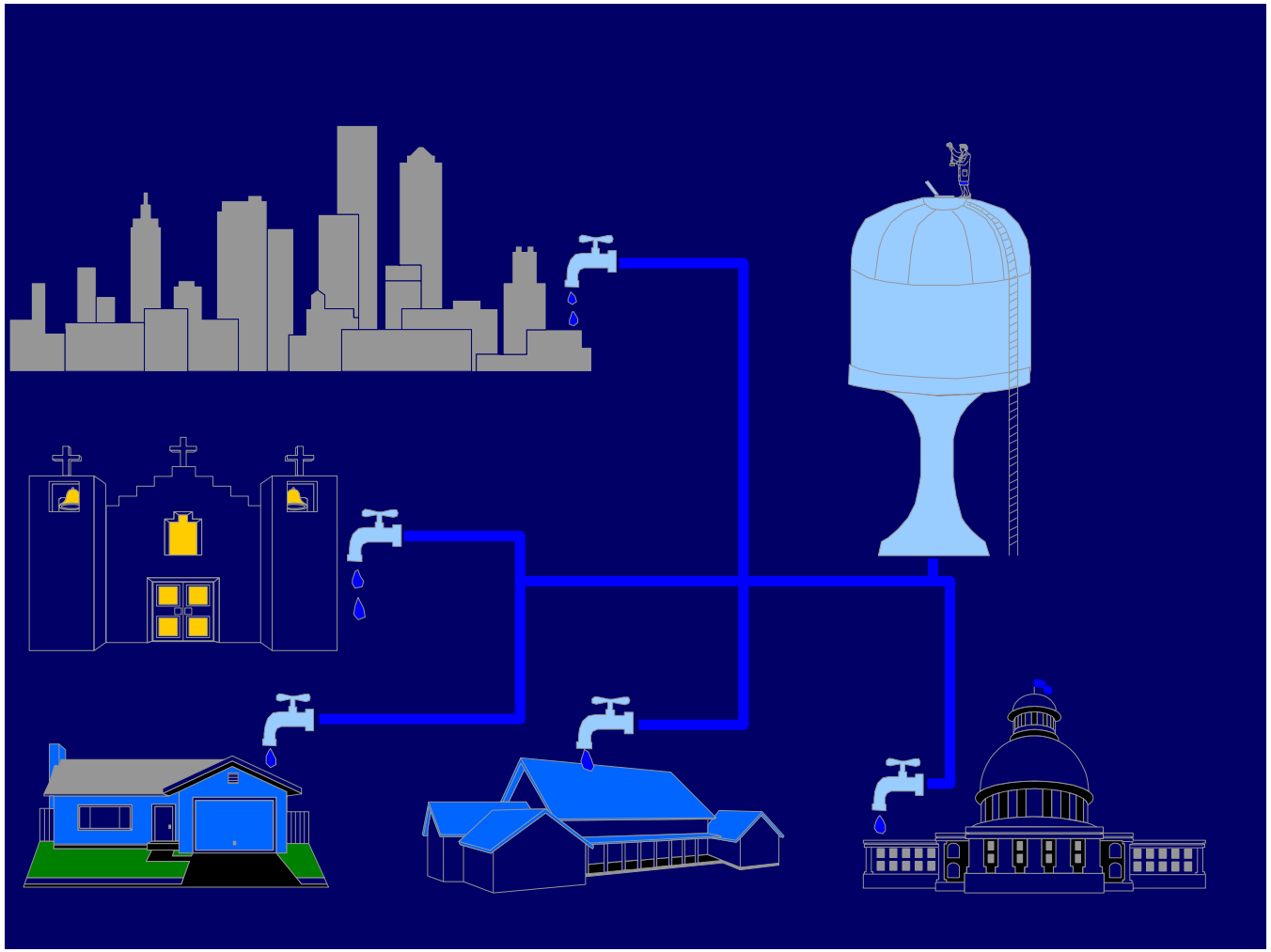
- Low agent required
- Delayed effect
- Pervasiveness
- Difficult to detect
- Either persistent or non-persistent

Methods of Dissemination

- Aerosol
- Fog from smoke generator
- Mist
- Food and water
- Munitions - Low explosive
- Sabotage



Sabotage



Methods of Dissemination

- Vectors (pathogens only)
  - Animal carriers that transfer BW
  - Mosquitoes (yellow fever/malaria), black horsefly (anthrax), dogs (rabies), fleas (plague)
- Communicability, contagious(Pathogens only)

Methods of detection

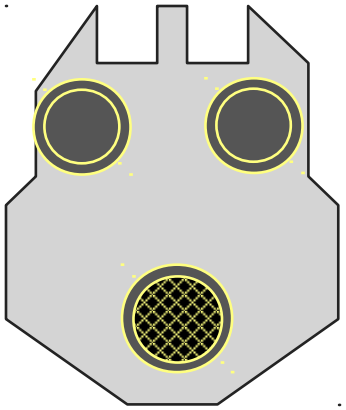
- Cannot see, smell, taste, touch or hear biological agents
- Increased occurrence of illness
- Interm Biological Agent Detection System (IBADS)
- Intelligence
  - Knowing an enemy's capabilities

Defense

- Active defense, Prevent attack
  - Destroy enemy's biological facilities
  - Intercept enemy's weapon system
- Passive, Before attack
  - Personal hygiene
  - Area sanitation
  - Immunizations
  - MOPP levels

Defense

- During attack
  - Battle dress
  - Protective mask
- After attack
  - Decontamination
  - Quarantine



Departments responsible for BW defense

- Medical
  - Direct sampling procedures
  - Clinical sampling
  - Treatment of casualties
- Damage Control
  - Decontamination
  - Conduct sampling when directed by medical

Summary and review

- Characteristics of Biological Agents
  - Pathogens
  - Toxins
- Methods of Dissemination & Detection